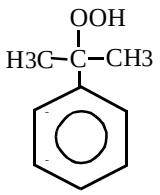
CUMENE HYDROPEROXIDE

CAS Registry Number: 80-15-9

Molecular Formula: $C_9H_{12}O_2$



Cumene hydroperoxide is a colorless to pale yellow liquid. It is reactive with metal containing materials and is the initiator for polymerization of styrene and acrylic monomer. Cumene hydroperoxide is slightly soluble in water and readily soluble in ether, alcohol, acetone, esters, hydrocarbons, and chlorinated hydrocarbons (HSDB, 1993).

Physical Properties of Cumene Hydroperoxide

Synonyms: isopropylbenzene hydroperoxide

Molecular Weight:	152.21
Boiling Point:	153 °C
Vapor Pressure:	0.24 mm Hg at 20 °C
Density/Specific Gravity:	1.05 (water = 1)
Flash Point:	175 °F
Conversion Factor:	1 ppm = 6.23 mg/m^3

(Sax, 1989)

SOURCES AND EMISSIONS

A. Sources

Cumene hydroperoxide is used to produce about 90 percent of the phenol produced in the United States. It is also used as a polymerization initiator, a catalyst for rapid polymerization, a curing agent for unsaturated polyester resins, a chemical intermediate for dicumyl peroxide, and a cross-linking agent (HSDB, 1993). The primary stationary sources of cumene hydroperoxide in California are manufacture in nonferrous foundries (castings), manufacturers of guided missiles and space vehicles, and electrical repair shops (ARB, 1997b).

B. Emissions

The total emissions of cumene hydroperoxide from stationary sources in California are estimated to be at least 880 pounds per year, based on data reported under the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

Cumene hydroperoxide may be formed in small quantities in the atmosphere from cumene by light catalyzed autooxidation and by reaction of cumene with alkylperoxy radicals and oxygen in natural waters (HSDB, 1993).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of cumene hydroperoxide.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of cumene hydroperoxide was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Cumene hydroperoxide will exist in the atmosphere in the gas phase, and is expected to react with the hydroxyl (OH) radical and to undergo wet and dry deposition. The calculated half-life and lifetime of cumene hydroperoxide due to reaction with the OH radical are 0.7 days and 1.0 days, respectively. Wet deposition is expected to be efficient, and a shorter half-life and lifetime than given above are therefore expected due to episodic precipitation events (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Although cumene hydroperoxide is reported as being emitted in California from stationary sources no health values (cancer or non-cancer) are listed in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to cumene hydroperoxide are inhalation, ingestion, and dermal contact.

Non-Cancer: Inhalation can cause throat irritation, coughing, shortness of breath, labored breathing, accumulation of fluids in the lung, weakness, incoordination, and decreases of red and white blood cell levels. Direct skin contact can cause sensitization and inflammation (HSDB, 1995). The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for cumene hydroperoxide (U.S. EPA, 1995a).

Cancer: No increase in tumor formation was observed in rats administered cumene

hydroperoxide subcutaneously for 77 weeks, though mutagenicity was observed in several test systems (HSDB, 1995). Cumene hydroperoxide has not been evaluated for carcinogenicity by the U.S. EPA or the International Agency for Research on Cancer (U.S. EPA, 1995a).